

REMARKS

Claims 1, 3, 4, 7, 8, 10-21, 23, 24, 26, and 27 are presently pending in this application. Claims 1, 7, 10, 11, 16, 23, and 27 are currently amended. Claims 3, 4, 8, 13-15, 19-21, 24 and 26 are previously presented. Claims 12, 17, and 18 are original. Claims 2, 5, 6, 9, 22, and 25 are cancelled, without prejudice. No new matter has been introduced.

The Rejection

Claims 1, 3-21, 23, 24, and 27 stand rejected under 35 USC §103(a) as being obvious and therefore unpatentable over Jarvenkyla et al. U.S. 5,759,461 in view of Toyosumi et al. U.S. 6,565,938 further in view of Hayakawa et al. U.S. 6,825,280. Claim 26 stands rejected under 35 USC §103(a) as being obvious and therefore unpatentable over Jarvenkyla et al. '461 in view of Katz U.S. 6,127,662. We respectfully traverse.

Applicant's Invention

In one aspect, Applicant's invention is directed to, in Claim 1, a plastics pipe which comprises an inner core and an outer removable skin layer bonded thereto. The inner core comprises polyethylene. The outer removable skin layer comprises an adherent polymeric material comprising a propylene homo-or co-polymer, a propylene block co-polymer, or a propylene random copolymer, chosen for its physical and mechanical properties, and an appropriate amount of an adhesion-reducing additive selected from esters of polyhydric alcohols, esters of fatty acids, cyclic esters of hydroxycarboxylic acids, acid anhydrides, fatty acid amides, ethoxylated amines and esters, and polybutylene. The adhesion-reducing additive is present in the skin layer in an amount such that the adhesion of the skin layer to the inner core is sufficient to prevent substantial undesired relative movement between the skin layer and the core during installation, but insufficient to prevent the outer skin layer from being cleanly removed by peeling, at least at the ends of the pipe, and insufficient to cause a substantial reduction in the impact strength of the inner core, the adhesive bond between the skin layer and the inner core

having a strength of from 0.2 N/mm to 2.0 N/mm, when measured by a rolling drum peel test as described in Appendix 1.

In another aspect, Applicant's invention is directed to, in Claim 23, a method for production of a plastics pipe generally as recited in claim 1, the method comprising co-extruding molten polymeric materials forming the inner core and the outer removable skin layer from one or more extruder dies, bringing the molten polymeric materials together and allowing them to cool, such that, on cooling, the adhesion of the skin layer to the inner core is sufficient to prevent substantial undesired relative movement between the skin layer and the core during installation of the pipe, but insufficient to prevent the skin layer from being cleanly removed by peeling, at least at the ends of the pipe, and insufficient to cause a substantial reduction in the impact strength of the inner core, the adhesion between the skin layer and the inner core having a strength of from 0.2 N/mm to 2.0 N/mm, when measured by a rolling drum peel test as described in Appendix 1.

Amendments

The independent claims (Claims 1 and 23) have been amended to recite that the inner core of the plastics pipe comprises polyethylene, and that the outer skin layer comprises a propylene homo or copolymer, a propylene block copolymer, or a propylene random copolymer. Basis for the former limitation may be found in Claim 5, and based for the latter limitation may be found in original Claim 6, both of which have now been cancelled, without prejudice. Claim 1 has also been amended to specify that the adherent polymeric material of the outer removable skin layer comprises an appropriate amount of an adhesion-reducing additive. Claim 1 was previously amended to specify that the peel strength is from 0.2 N/mm to 2.0 N/mm when measured by the defined peel test. On the basis of these amendments, and the arguments presented below, we submit that Claim 1 is distinguishable over the cited prior art.

Argument

Applicant notes in particular, the Examiner maintains that Toyosumi et al. U.S. 6,565,938 and Hayakawa et al. U.S. 6,825,280 should be read together because they are in related technical

fields. The Examiner thus suggests that materials used in laminate films for food packaging in the manner described in Toyosumi et al. '938 could be used in the same way as the propylene block copolymer materials of Hayakawa et al. '280. However, this is clearly unreasonable since the considerations relevant to the preparation and use of laminate plastic films are necessarily different from those when preparing bulk materials from block copolymers. Furthermore, it is difficult to see how or why the person of ordinary skill in the art could genuinely be motivated to take this information and then apply it to the teaching of Jarvenkyla et al. U.S. 5,759,461 without the benefit of hindsight. Hayakawa et al. '280 discloses a vast range of block copolymers having a range of different additives and compositions. Thus, absent use of Applicant's invention as a guide, there is no reason for the person of ordinary skill in the art to select the particular materials alleged by the Examiner in order to arrive at the invention.

Furthermore, even if the materials had been available from the proposed combination of the other two documents (which Applicant does not concede), the important properties underlying the pipes of the invention art still not disclosed. Rather, it is the careful balance of properties, reflected in a bond strength of from 0.2 N/mm to 2.0 N/mm, which is either directly or indirectly in all of the claims, that gives rise to the advantageous features of the pipes of the present invention, that is permitting easy peeling when required but also permitting the skin layer to retain its integrity during the laying of pipes.

Jarvenkyla et al. '461 discloses a method of forming a multilayer pipe for conducting fluids. It is in the same field as the invention of the present application and appears to be the closest art cited by the Examiner. Jarvenkyla et al. '461 provides limited disclosure regarding the materials of the multilayer pipe and the characteristics of the pipe. Its specification does, however, mention that an adhesion inhibiting or enhancing agent may be added between the outer layer and the core pipe (column 3, lines 49 to 52). However, this document does not make any reference to the bond strengths, as claimed in the present application.

Toyosumi et al. '938 relates to saponified ethylene vinyl acetate copolymers (EVOH) for multi-lamellar vessels and packaging, but not pipes. This patent mentions that the resin

composition may contain many different materials including plasticisers, with glycerol given as an example of an aliphatic polyhydric alcohol; and lubricants such as the saturated aliphatic amide stearamide, ethylene-bis-stearamide and fatty acid esters. This patent does not, however, refer to any use in piping or any related field, nor is there indicate that any of these materials would be suitable additives, i.e., additives that could reduce the adhesion between inner and outer layers of a plastic pipe.

Hayakawa et al. '280 is directed to propylene block copolymers with an excellent balance between rigidity, impact resistance and a number of other desirable properties. It is cited for its disclosure of specific additives with the propylene block copolymer. It is a lengthy specification that discloses compositions with many different additives, but there is nothing within its specification that relates to piping or adhesion between layers of polymers.

Katz U.S. 6,127,662 is cited by the Examiner for its disclosure that an electrofusion technique can be used to join two pipes together. As mention above, this objection goes only to Claim 26, which is dependent from Claim 1, and we submit that Claim 26 is also allowable over the prior art on that basis.

Conclusion

For the reasons discussed above, Applicant respectfully submits that this application is now in condition for allowance.

If the Examiner feels that it would further advance prosecution of the present application, she is invited to telephone the undersigned at (617) 521-7015.

Any circumstance in which Applicant has (1) addressed certain comments of the Examiner does not mean that Applicant concedes other comments of the Examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the Applicant concedes any of the Examiner's positions with respect to that claim or other claims.


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No fees are believed due for this patent application. However, please apply any charges or credits to deposit account 06-1050, referencing attorney docket number 10899-0011001.

Respectfully submitted,

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